Claims

1. Heat-exchanger tube (22), particularly for the internal heat exchanger (11) of a motor-vehicle high-pressure air-conditioning system (1) with a central channel (29) that features a closed wall, from which several projections (31) extend into the central channel (29), with several outer channels (36) that are arranged concentric to the central channel (29) and that are separated from each other by partitions (37).

2. Heat-exchanger tube according to Claim 1, characterized in that the number of partitions (37) is greater than the number of projections (31).

3. Heat-exchanger tube according to Claim 1, characterized in that the outer channels (36) each feature a width at their radially inner side, which is smaller than their height measured in the radial direction.

4. Heat-exchanger tube according to Claim 1, characterized in that the outer channels (36) each feature a width at their radially outer side, which is smaller than their height measured in the radial direction.

5. Heat-exchanger tube according to Claim 1, characterized in that the sides of the partitions (37) are designed to be parallel.

6. Heat-exchanger tube according to Claim 1, characterized in that all outer channels (36) feature matching cross sections.

7. Heat-exchanger tube according to Claim 1, characterized in that the outer channels (36a, 36b) feature at least two different cross sections.

8. Heat-exchanger tube according to Claim 1, characterized in that all partitions (37) feature a uniform wall thickness.

9. Heat-exchanger tube according to Claim 1, characterized in that between the central channel (29) and the outer channels (36), a wall thickness is provided that is greater than the wall thickness of the partitions (37).

10. Heat-exchanger tube according to Claim 1, characterized in that between the central channel (29) and the outer channels (36), a wall thickness is provided that is greater than the wall thickness of wall regions (38) that seal the outer channels (36) from the outside.

11. Heat-exchanger tube according to Claim 1, characterized in that the outer channels (36) feature a wedge-shaped cross section.

12. Heat-exchanger tube according to Claim 1, characterized in that the central channel (29) features a cross-shaped cross section.

13. Heat-exchanger tube according to Claim 1, characterized in that the projections (31) feature a triangular rounded cross section.

14. Heat-exchanger tube according to Claim 1, characterized in that the projections (31) feature sides that form a right angle (α) with each other.

15. Heat-exchanger tube according to Claim 1, characterized in that the projections (31) are designed as ribs (33).

16. Heat-exchanger tube according to Claim 15, characterized in that the ribs (33) are designed to be straight in the axial direction.

17. Heat-exchanger tube according to Claim 1, characterized in that it is designed as an aluminum extruded part.

18. Heat exchanger (11) with a heat-exchanger tube (22) according to one of the preceding claims.

19. Heat exchanger according to Claim 18, characterized in that the heat-exchanger tube (22) is connected at both ends (44, 45) to connecting pieces (42, 43) that each feature a collection chamber (47, 66) in order to combine all outer channels (36) into one channel.

20. Heat exchanger according to Claim 18, characterized in that the connecting pieces (42, 43) feature means for uniform distribution of a fluid stream between the outer channels (36) or for uniform combination of the fluid stream arriving from the outer channels (36).

21. Heat exchanger according to Claim 20, characterized in that the means for uniform distribution or combination of the fluid stream is a diffuser chamber (47).

22. Heat exchanger according to Claim 20, characterized in that the means for uniform distribution or combination of the fluid stream, is a twisting chamber (66).

23. Heat exchanger according to Claim 21, characterized in that the diffuser chamber is designed to be conical and features at least two inlet or outlet channels (54, 55).

24. Heat exchanger according to Claim 22, characterized in that the twisting chamber (66) features an essentially cylindrical cross section.

25. Heat exchanger according to Claim 21, characterized in that the twisting chamber features an inlet or outlet connection (57) shifted in parallel with and inclined against the radial direction.

26. Heat exchanger according to Claim 18, characterized in that the connecting pieces (42, 43) on both ends (44, 45) of the heat-exchanger tube are designed identical to each other.

27. Heat exchanger according to Claim 18, characterized in that the connecting pieces (43) are connected to the heat-exchanger tube (22) by means of a press-fit connection.

28. Heat exchanger according to Claim 27, characterized in that the press-fit connection is a press-fit connection produced through plastic deformation of the connecting piece (43).

29. Heat exchanger according to Claim 27, characterized in that the connecting piece (43) includes a connection base (89) that is attached to the remaining connecting piece (89) and that features a tubular needle (92) that extends into the central channel (29) and that is connected to the walls of the central channel by a press-fit connection.

30. Air-conditioning system (1), particularly for motor vehicles, with a compressor (2) for preparing compressed fluid at an output (3), with a condenser (6) that is connected to the compressor (2) by a line (5) for cooling the compressed fluid, with an expansion valve (15) that receives cooled fluid through a high-pressure line (14) from the condenser (6) and outputs to an evaporator (16), with a return line (17, 21), through which the fluid from the evaporator (16) is returned to the compressor (2), and with a heat exchanger (11) according to one of Claims 17-24, whose central channel (29) is connected to the high-pressure line (8, 14), and whose outer channels (36) are connected to the return line (17, 21).